



Final

Environmental Assessment Construction of an Airman Dormitory

Wright-Patterson Air Force Base

Contract No. F33601-01-DW002
Delivery Order 5010

Submitted to:

**Wright-Patterson Air Force Base
88th Air Base Wing
Office of Environmental Management**



**Environmental Management
Wright-Patterson AFB**

Prepared by:

**IT Corporation
11499 Chester Road
Cincinnati, Ohio 45246**

February 2003

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE FEB 2003		2. REPORT TYPE		3. DATES COVERED 00-00-2003 to 00-00-2003	
4. TITLE AND SUBTITLE Environmental Assessment Construction of an Airman Dormitory, Wright-Patterson Air Force Base			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) IT Corporation,11499 Chester Road,Cincinnati,OH,45246			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 52	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FINAL
FINDING OF NO SIGNIFICANT IMPACT

Name of Action: Construction of an Airman Dormitory, Wright-Patterson Air Force Base (WPAFB), Ohio

A number of dormitories housing unaccompanied enlisted personnel are located in the Kittyhawk Community Center and are bordered by Birch, Buckeye, and Hemlock Streets. These facilities do not provide adequate on-base housing for the number of unaccompanied enlisted personnel located at the base. A new airman dormitory and associated parking lots have been proposed. The dormitory and parking lots would be located on Birch Street. The proposed dormitory is a three-story, 144-room facility with reinforced concrete foundation and floor slabs, masonry walls, and roof. In addition to construction of the dormitory and associated parking lots, the length of Birch Street passing between Buckeye Street and Hemlock Street would be relocated to run south of one of the parking lots.

Proposed Action and Alternative:

The proposed action is to construct the airman dormitory and associated parking lots. There were two alternatives analyzed:

Under Alternative A, the No Action alternative, the airman dormitory would not be constructed. Alternative A also serves as a baseline against which the Proposed Action can be compared.

Alternative B, the Proposed Action, includes the construction of the new airman dormitory and two parking lots.

Environmental Consequences:

The environmental consequences of the Proposed Action to construct the airman dormitory are as follows:

Biological Resources: There would be no impact to biological resources under Alternative A. Under Alternative B, there would be nominal impacts from the loss of vegetation on the construction site. The types of vegetation that would be lost are common throughout the base. The site would be re-landscaped.

Water Resources: There would be no impact to water resources under Alternative A. Under Alternative B, minor, short-term impacts to surface water would potentially occur due to surface water runoff during site preparation, excavation, and construction activities. These impacts would be minimized because erosion controls would be implemented.

Land Use: There would be no impact to land use under Alternative A. Under Alternative B, land use where the west and south parking lots would be located would change from Community Commercial and Open Space, respectively to Housing Unaccompanied.

Soils: There would be no impact to soils under Alternative A. Under Alternative B, there would be potential minor impacts (i.e., soil erosion) during site preparation, excavation, and construction activities. Impacts, however, would be minimized because erosion and siltation controls would be implemented. There would be no long-term impacts under Alternative B.

Air Quality: There would be no impact to air quality under Alternative A. Under Alternative B, there would be nominal short-term impacts upon air quality during site preparation, excavation, and construction activities from particulate matter and engine exhaust emissions. Impacts would be minimized by the use of dust suppression measures. There would be no long-term impacts because project activities are short in duration.

Noise: There would be no impact to noise under Alternative A. Under Alternative B, there would be short-term minor impacts due to heavy equipment used during site preparation, excavation, and construction activities. Impacts would be minor because these activities would be performed during normal working hours. Increases in noise levels are expected to be intermittent while the proposed action is carried out.

Health and Safety: There would be no impact to health and safety under Alternative A. Under Alternative B, there would be potential impacts to project workers due to accidents during site preparation, excavation, and construction activities. Impacts would be negligible because adherence to health and safety regulations would minimize hazards.

Socioeconomics: There would be no impact to socioeconomics under Alternative A. Under Alternative B, there would be nominal, beneficial impact to the local economy during site preparation, excavation, and construction activities.

Transportation/Traffic: There would be no impact to traffic under Alternative A. Under Alternative B, there would be short-term impacts to traffic circulation during project activities. Once activities are completed, a nominal increase in traffic circulation in the vicinity of the airman dormitory would be expected.

Regulatory Requirements:

Under 40 CFR 122.26, permits would be required for discharges into storm sewers and/or for erosion control due to construction activities. A "Permit-to-Install" would be required if significant changes or additions are made to sewer systems or water mains.

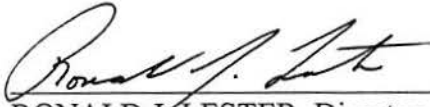
Public Notice:

A public notice was posted in the Dayton Daily News on 17 March 2003. The public comment period for the final EA was 17 March 2003 through 16 April 2003. No comments were received.

Finding of No Significant Impact (FONSI):

The proposed action is to construct an airman dormitory and associated parking lots. The No Action Alternative was analyzed where no new airman dormitory would be constructed. Based on my review of the facts and analysis contained in the EA, I conclude that Alternatives A and B

(the Proposed Action) will not have a significant impact either by itself or considering cumulative impacts. Accordingly, the requirements of the National Environmental Policy Act, the Council on Environmental Quality Regulation and 32 CFR 989 have been fulfilled, and an environmental impact statement is not required and will not be prepared.



RONALD J. LESTER, Director
Office of Environmental Management

24 Apr 03
DATE

Final

**Environmental Assessment
Construction of an Airman Dormitory**

**Contract No. F33601-01-DW002
Delivery Order 5010**

Submitted to:

**Wright-Patterson Air Force Base
88th Air Base Wing
Office of Environmental Management**

Prepared by:

**IT Corporation
11499 Chester Road
Cincinnati, Ohio 45246**

February 2003

Table of Contents

List of Tables	v
List of Figures	vi
List of Appendices	vii
Acronyms	viii
1.0 Purpose and Need for Action	1-1
1.1 Project Description	1-1
1.2 Decisions Needed	1-1
1.3 Scope of Environmental Analysis	1-2
1.4 Regulatory Requirements	1-2
2.0 Description of Proposed Action and Alternatives	2-1
2.1 Introduction	2-1
2.2 Process Used to Formulate Alternatives	2-1
2.3 Alternatives Eliminated From Detailed Study	2-2
2.4 Alternatives Considered	2-2
2.4.1 Alternative A: No Action	2-2
2.4.2 Alternative B: Construction of an Airman Dormitory	2-2
2.5 Comparison of Alternatives	2-3
3.0 Affected Environment	3-1
3.1 Introduction	3-1
3.2 Natural Resources	3-1
3.2.1 Vegetation	3-1
3.2.2 Wildlife	3-1
3.2.3 Threatened and Endangered Species	3-2
3.3 Water Resources	3-3
3.3.1 Groundwater	3-3
3.3.2 Surface Water	3-3
3.3.3 Floodplain	3-4
3.3.4 Wetlands	3-4
3.4 Installation Restoration Program (IRP)	3-4
3.5 Land Use	3-5
3.6 Soils	3-5
3.7 Cultural Resources	3-6

Table of Contents (continued)

3.8	Air Quality	3-7
3.9	Noise	3-8
3.10	Health and Safety	3-10
3.11	Socioeconomics	3-11
3.12	Transportation/Traffic	3-11
4.0	Environmental Consequences	4-1
4.1	Introduction	4-1
4.2	Natural Resources	4-1
4.2.1	Vegetation	4-1
4.2.1.1	Alternative A: No Action	4-1
4.2.1.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-1
4.2.2	Wildlife	4-1
4.2.2.1	Alternative A: No Action	4-1
4.2.2.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-1
4.2.3	Threatened and Endangered Species	4-1
4.2.3.1	Alternative A: No Action	4-1
4.2.3.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-2
4.3	Water Resources	4-2
4.3.1	Groundwater	4-2
4.3.1.1	Alternative A: No Action	4-2
4.3.1.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-2
4.3.2	Surface Water	4-2
4.3.2.1	Alternative A: No Action	4-2
4.3.2.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-2
4.3.3	Floodplain	4-3
4.3.3.1	Alternative A: No Action	4-3
4.3.3.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-3

Table of Contents (continued)

4.3.4	Wetlands	4-4
4.3.4.1	Alternative A: No Action	4-4
4.3.4.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-4
4.4	Installation Restoration Program Sites	4-4
4.4.1	Alternative A: No Action	4-4
4.4.2	Alternative B: Construction an Airman Dormitory (Proposed Action) ..	4-4
4.5	Land Use	4-4
4.5.1	Alternative A: No Action	4-4
4.5.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-4
4.6	Soils	4-4
4.6.1	Alternative A: No Action	4-4
4.6.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-4
4.7	Cultural Resources	4-5
4.7.1	Alternative A: No Action	4-5
4.7.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-5
4.8	Air Quality	4-5
4.8.1	Alternative A: No Action	4-5
4.8.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-5
4.9	Noise	4-6
4.9.1	Alternative A: No Action	4-6
4.9.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-6
4.10	Health and Safety	4-7
4.10.1	Alternative A: No Action	4-7
4.10.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-7
4.11	Socioeconomics	4-8
4.11.1	Alternative A: No Action	4-8

Table of Contents (continued)

4.11.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-8
4.12	Transportation/Traffic	4-8
4.12.1	Alternative A: No Action	4-8
4.12.2	Alternative B: Construction of an Airman Dormitory (Proposed Action)	4-8
4.13	Cumulative Impacts	4-8
4.14	Unavoidable Adverse Effects	4-9
4.15	Relationship of Short-Term Uses and Long-Term Productivity	4-9
4.16	Irreversible and Irretrievable Commitments of Resources	4-9
5.0	List of Preparers and Contributors	5-1
6.0	List of Agencies and Persons Consulted	6-1
7.0	References	7-1

List of Tables

- | | |
|-------|---|
| 1.4-1 | Summary of Applicable Regulations for the Proposed Action and Alternative |
| 2.5-1 | Comparison of Environmental Consequences of the Proposed Action and Alternative |

List of Figures

- 1.1-1 Area Location Map
- 1.1-2 Topographic Location of the Proposed Airman Dormitory
- 1.1-3 Location of Proposed Airman Dormitory
- 1.1-4 Aerial View (2002) of the Proposed Locations of the Airman Dormitory and Associated Parking Lots
- 2.4-1 Photographs of the Proposed Location for the Dormitory and Associated Parking Lots
- 2.4-2 Photographs of the Proposed Location of Parking Lot
- 3.3-1 Boundary of the Buried Valley Aquifer
- 3.3-2 Major Surface Water Features at Wright-Patterson AFB
- 3.3-3 Surface Water Features near the Proposed Location of the Airman Dormitory
- 3.3-4 Storm Sewer Network, Outfall Area 12
- 3.3-5 Outfall Area 12 at Hebble Creek
- 3.3-6 Regional Bedrock Topography

List of Appendices

- A Correspondence with the Ohio Department of Natural Resources
- B Correspondence with the U.S. Fish & Wildlife Service
- C Construction of Airman Dormitory-Emission Estimates

List of Acronyms/Abbreviations

AFI	Air Force Instruction
AFMAN	Air Force Manual
AFMC	Air Force Materiel Command
AFPD	Air Force Policy Directive
AFRIMS	Air Force Restoration Information Management System
AICUZ	Air Installation Compatible Use Zone
ANSI	American National Standards Institute
ASC	Aeronautical Systems Center
bgs	below ground surface
BHE	BHE Environmental, Inc.
BHPO	Base Historic Preservation Officer
BOD	biological oxygen demand
BMP	Basewide Monitoring Program
BTEX	benzene, toluene, ethylbenzene, xylenes
CAAA	Clean Air Act Amendments
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
COD	chemical oxygen demand
CRMP	Cultural Resources Management Plan
dBA	decibels
DoD	U.S. Department of Defense
EA	environmental assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FICON	Federal Interagency Committee on Noise
FY	Fiscal Year
GLARC	Great Lakes Archaeological Research Center
GLTS	Gravel Lake Tanks Site
gpm	gallons per minute
ICI	International Consultants Incorporated
IRP	Installation Restoration Program
IT	IT Corporation
km	kilometers
L _{dn}	Time-integrated average A-weighted sound level during a 24-hour period
MSA	Metropolitan Statistical Area
MSL	mean sea level

List of Acronyms/Abbreviations (continued)

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O ₃	ozone
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PM ₁₀	Particulate Matter (less 10 microns in diameter)
PM _{2.5}	Particulate Matter (less than 2.5 microns in diameter)
PTI	Permit to Install
RAPCA	Regional Air Pollution Control Agency
SAIC	Science Applications International Corporation
SCS	Soil Conservation Service
SO _x	Sulfur Oxides
SPM	Special Purpose Monitor
TKN	total Kjeldahl nitrogen
TPH	Total Petroleum Hydrocarbon
TPY	Tons Per Year
TSS	Total Suspended Solids
USACERL	U.S. Army Construction Engineering Research Laboratory
USAF	U.S. Air Force
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WPAFB	Wright-Patterson Air Force Base

1.0 Purpose and Need for Action

This environmental assessment (EA) presents the proposed action of constructing an airman dormitory at Wright-Patterson Air Force Base (WPAFB), Ohio. This EA has been performed in accordance with the National Environmental Policy Act (NEPA) of 1969, 40 Code of Federal Regulations (CFR), Part 1500, the Council on Environmental Quality (CEQ) regulations implementing NEPA, and the U.S. Air Force (USAF) Environmental Impact Analysis Process (EIAP) [Air Force Instruction (AFI) 32-7061]. The purpose of the proposed action is to construct a new facility to provide adequate housing for unaccompanied enlisted personnel. Currently, the base does not have sufficient on-base housing for these personnel.

1.1 Project Description

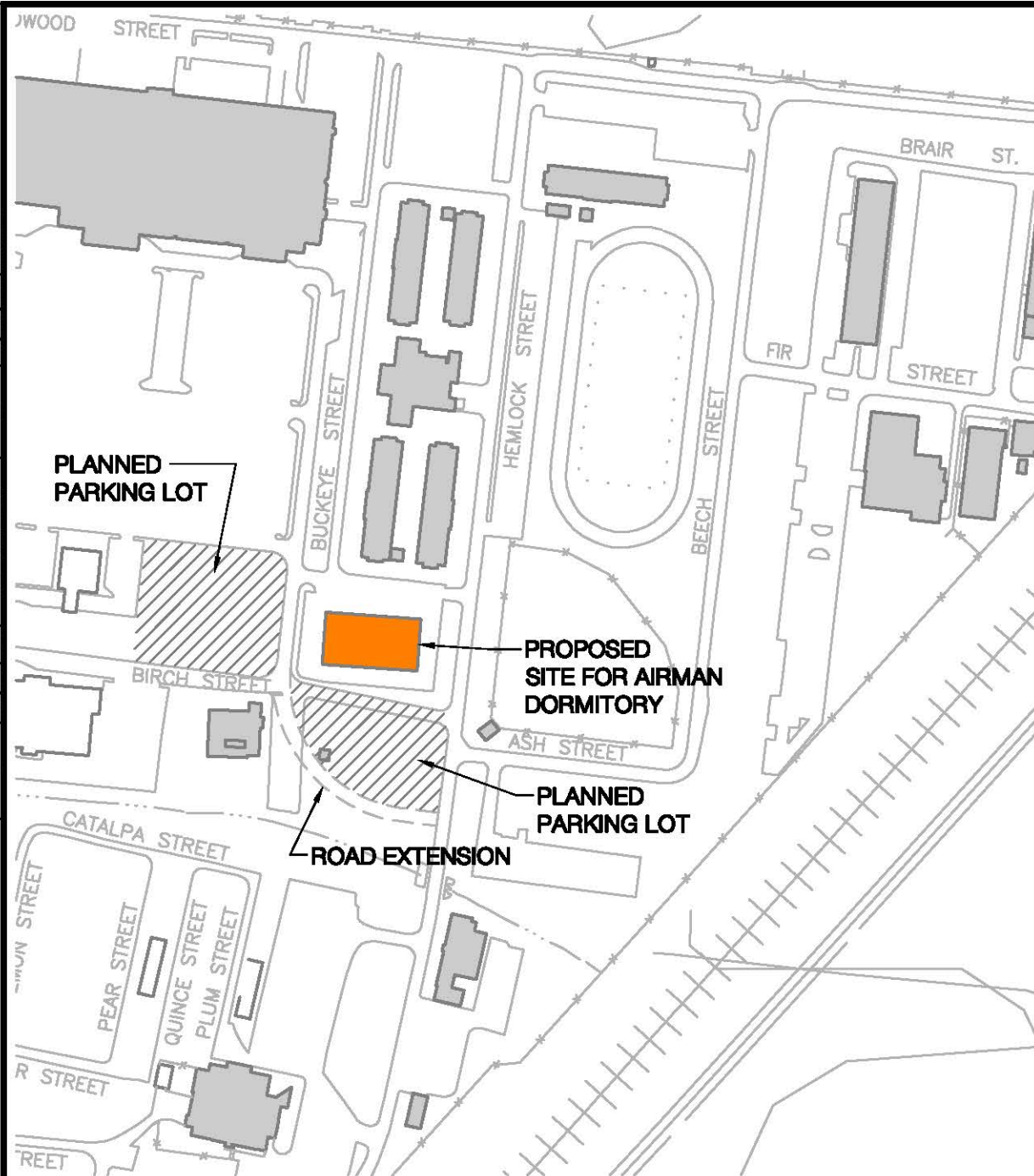
WPAFB is located in the southwest portion of the State of Ohio in Greene and Montgomery counties, 10 miles east of the City of Dayton (Figure 1.1-1). The base encompasses 8,145 acres and is classified as non-industrial with mixed development. WPAFB is subdivided into three areas: A, B, and C. The installation was formed as a consolidation of two bases: Wright Field (Area B) and Patterson Field (Areas A and C). Area B is separated from Areas A and C by State Route 444 and is more highly developed than the other areas of the base. Area A contains the majority of administrative functions, Area B focuses on research and development activities, and Area C consists of airfield operations (ICI/SAIC, 1995; WPAFB, 1994a; Woolpert, 2001).

The proposed location of the airman dormitory is in Kittyhawk Community Center in Area C (Figures 1.1-2, 1.1-3, and 1.1-4) on Birch Street. This portion of the base has always been dedicated to military housing (e.g., dormitories, visiting airmen's quarters, temporary family housing) and recreational facilities (e.g., base theater, bowling alley, gymnasium, swimming pool, and athletic fields). The Commissary and Exchange complex, credit union, Area A/C heating plant and other base service buildings are also located in this area. As stated above, construction of the dormitory is needed to provide adequate housing for unaccompanied enlisted personnel.

1.2 Decisions Needed

The purpose of this EA is to analyze the proposed action and its alternative and determine whether the proposed action (i.e., construction of the airman dormitory) is expected to have significant impacts on human health, safety, or the environment. The impacts to be considered

DRAWN BY	MSN	CHECKED BY	TC	11/25/02	DRAWING	2002 49-03.DWG
	10/29/02	APPROVED BY	CH	11/25/02	NUMBER	



SCALE: 1"=300'

0 100 200 300 600 FEET

Figure 1.1-3

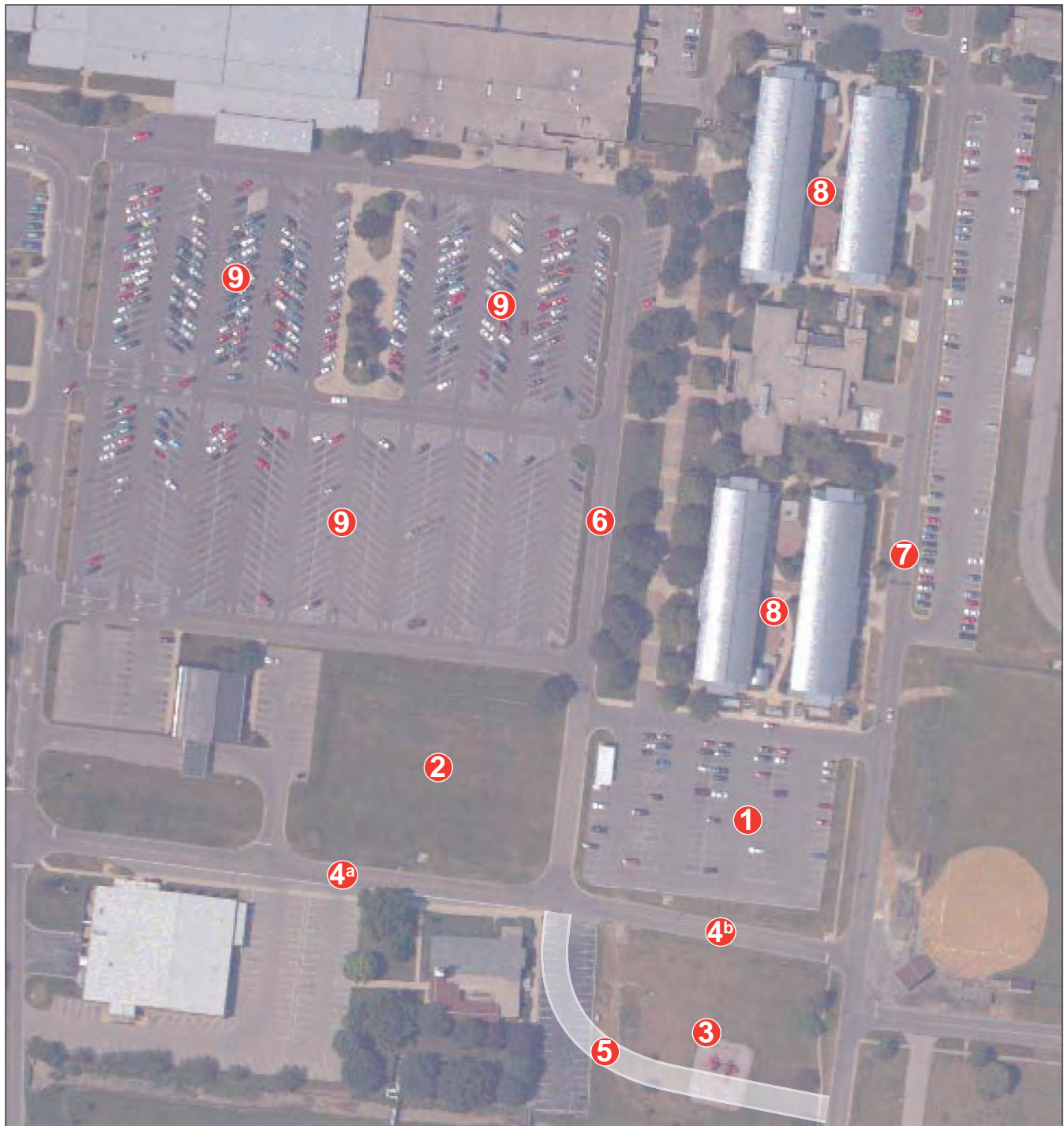
Location of Proposed Airman Dormitory

PREPARED FOR

Wright-Patterson Air Force
Base Dayton, Ohio



IT CORPORATION
11499 CHESTER ROAD
CINCINNATI, OHIO 45246



- | | |
|--|---|
| ① Proposed location of New Airman Dormitory | ⑤ Proposed road extension |
| ② Planned parking lot (west) | ⑥ Buckeye Street |
| ③ Planned parking lot (south) | ⑦ Hemlock Street |
| ④ ^a Birch Street | ⑧ Existing dormitory |
| ④ ^b Portion of Birch Street to be removed | ⑨ Commissary and Exchange Complex parking |

Figure 1.1-4. Aerial view (2002) of the proposed locations of the Airman Dormitory and associated parking lots.

include those resulting from all phases of the construction activities: site preparation, building construction, parking lot construction, and landscaping. The EA will support the interrelated decisions concerning the construction of the dormitory and provide the decision maker and the public with information required to understand the short-term and long-term consequences of the proposed action and its alternative. Where applicable, mitigative measures will be recommended to minimize adverse impacts. The necessity for the preparation of an Environmental Impact Statement (EIS) will also be determined.

1.3 Scope of Environmental Analysis

The EA will analyze impacts associated with the construction of the airman dormitory. Although this document will address all environmental issues specified under NEPA, the primary issues of concern associated with the proposed construction of the dormitory include:

- Geology and soil
- Air quality
- Noise
- Transportation/traffic.

Other issues to be addressed, to a lesser degree, include:

- Biological resources
- Water resources
- Health and safety
- Installation Restoration Program (IRP) sites
- Land use
- Cultural/historic resources
- Socioeconomics.

1.4 Regulatory Requirements

Statutes and regulations to which the Air Force must comply are summarized in Table 1.4-1. Permits issued by the Ohio Environmental Protection Agency (OEPA) may be required to cover actions that could potentially affect sewer systems at the base. For example, significant changes or additions to the sanitary sewer systems or installation/ relocation of water mains as a result of building construction will require a "Permit to Install." Furthermore, permits would be required for discharges into storm sewers and/or for erosion control due to construction activities.

Table 1.4-1
Summary of Applicable Regulations
for the Proposed Action and Alternative
Page 1 of 2

Natural Resources

- Air Force Instruction (AFI) 32-7064, Integrated Natural Resource Management Plan
- Endangered Species Act of 1973, 16 USC §1531 et seq.
50 CFR Part 200
50 CFR Part 402
33 CFR Parts 320-330
- Executive Order 11990 – Protection of Wetlands
- 40 CFR, Part 6, Appendix A – Protection of Floodplains
- 40 CFR, Part 6, Appendix A – Protection of Wetlands
40 CFR, Part 230 – Protection of Wetlands
40 CFR, Parts 320-330 – Protection of Wetlands
- Clean Water Act, Section 404
- Ohio Revised Code (ORC) 1531.25, Protection of Species Threatened with State-Wide Extinction

Land Use

- AFI 32-7063, Air Installation Compatible Use Zone (AICUZ) Program

Cultural/Historic Resources

- AFI 32-7065, Cultural Resources Management
- National Historic Preservation Act of 1966, as amended
- 36 CFR Part 800 – Protection of Historic and Cultural Properties

Air Quality

- National Ambient Air Quality Standards (NAAQS) – 40 CFR §81.34 and §81.336
- Ohio Administration Code (OAC) 3745-17 Particulate Matter Standards
- OAC 3745-31-02 Delegation for Enforcement of Requirements

Noise

- 29 CFR 1910.95 Occupational Noise Exposure

Health and Safety

- 29 CFR 1926 Safety and Health Regulations for Construction
- 29 CFR 1910.1200 Hazard Communication
- 29 CFR 1910.133 Eye and Face Protection

Table 1.4-1
Summary of Applicable Regulations
for the Proposed Action and Alternatives
Page 2 of 2

- 29 CFR 1910.34 Respiratory Protection
- 29 CFR 1910.135 Occupational Head Protection
- 29 CFR 1910.136 Occupational Foot Protection
- Subpart Z Toxic and Hazardous Substances
- Occupational Safety and Health Act of 1970, revised 1978

Wastewater/Stormwater

- 40 CFR Part 122.26 Storm Water Discharges
- OAC 3745-31 Permit to Install New Source of Pollution
- OAC 3745-33 Ohio National Pollutant Discharge Elimination System (NPDES) Permit
- OAC 3745-38 Notice of Intent
- City of Dayton Sewer Use Ordinance (September 21, 1994)

2.0 Alternatives Including the Proposed Action

2.1 Introduction

This chapter describes the Air Force's proposed construction of a new airman dormitory at WPAFB. The following sections also describe a reasonable alternative to the proposed action that has been analyzed for environmental consequences in Chapter 4.0.

The proposed action and alternative are as follows:

- Alternative A – No Action
- Alternative B – Construction of an Airman Dormitory (Proposed Action).

Section 2.2 describes the formulation of Alternatives; Section 2.3 describes the Alternatives eliminated from detailed study; Section 2.4 describes the proposed action and the No Action Alternative; and Section 2.5 provides a comparison of the Alternatives.

2.2 Process Used to Formulate Alternatives

As part of the NEPA process, the Air Force must analyze reasonable alternatives to the proposed action and the "no action" alternative, as fully as the proposed action. "Reasonable" alternatives are defined under 32 CFR Part 989.8 as "...alternatives that meet the underlying purpose and need for the proposed action and that would cause a reasonable person to inquire further before choosing a particular course of action." Reasonable alternatives to the proposed action are described below.

The proposed action, Alternative B, was formulated on the basis for the need to provide adequate housing for unaccompanied enlisted personnel. Currently, the base has insufficient on-base housing to accommodate these personnel.

The no action alternative, Alternative A, was formulated as the antithesis to constructing a new airman dormitory; that is, a dormitory would not be built. In essence, the no action alternative acts as a "baseline" from which to measure potential impacts resulting from the implementation of the proposed action.

2.3 Alternatives Eliminated From Further Study

The alternatives listed above were designated by the Air Force as reasonable alternatives to be considered for evaluation. No other alternatives (i.e., actions or locations) were considered.

2.4 Descriptions of Alternatives Considered

The proposed action and alternative to the proposed action, the no action alternative, are described below.

2.4.1 Alternative A: No Action

Under the No Action alternative, it is assumed that a new airman dormitory would not be built. This alternative will serve as a baseline against which the Proposed Action can be compared.

2.4.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

The proposed dormitory would be a three-story structure of approximately 4,750 square meters [51,130 square feet (ft²)] located on Birch Street between Buckeye Street and Hemlock Street (Figure 1.1-3). The facility's structure would consist of a reinforced concrete foundation and floor slab masonry walls and roof. The 144-room dormitory would include room-bath/kitchen-room modules, laundry facilities, and storage and lounge areas. The building would meet all seismic requirements (WPAFB, 2002a).

The building would be constructed on a site that currently is used for parking (Figure 2.4-1). Two parking lots would be constructed in open areas adjacent to the proposed dormitory (Figure 1.1-3). One parking lot would be located to the west at the intersection of Birch Street and Buckeye Street (Figure 2.4-1) and covers approximately 62,500 ft². The other parking lot would be located to the south on Birch Street (Figure 2.4-2) and covers approximately 50,000 ft². Site preparation activities for construction of the dormitory would begin with stripping the current asphalt covering of the existing parking lot, followed by excavation and compaction of the soil. Site preparation activities associated with construction of the parking lots would begin with stripping the vegetative cover and topsoil followed by compaction of the soil. The areas would be graded so that storm water runoff would flow to existing drainage. Site work would include mechanical (e.g., water and telephone lines) and electrical utilities located both above and below ground. Paved access (sidewalks) would be provided between the facility and parking lots. Once construction is completed, the site would be landscaped where appropriate.



Proposed location of Airman Dormitory. The dormitory would be constructed where the parking lot is currently located.



Proposed location of new parking lot. The parking lot would be constructed in the open space west of the new dormitory.



The parking lot would be constructed in the open space south of the new dormitory.

DRAWING NO.
K-838197-3000-10/02-W

CHECKED BY
APPROVED BY

KMS
10/29/02

DRAWING
BY

In addition to construction of the dormitory and associated parking lots, a portion of Birch Street would be relocated (Figure 1-1.3). The length of Birch Street passing between Buckeye Street and Hemlock Street would become part of the south parking lot. Birch Street would then be redirected around the new parking lot south of the new dormitory.

2.5 *Comparison of Alternatives*

The impacts associated with the proposed action and alternative, the No Action Alternative, are summarized in Table 2.5-1. The information includes a concise definition of the issues addressed under each alternative and the environmental impacts associated with each alternative. The analysis is based on information discussed in detail in Chapter 4.0, Environmental Consequences.

Table 2.5-1
Comparison of Environmental Consequences
of the Proposed Action and Alternative
Page 1 of 2

Resources	Alternative A: No Action	Alternative B: Construction of an Airman Dormitory (Proposed Action)
Natural Resources		
Vegetation	Short-Term: No impact. Long-Term: No impact.	Short-Term: Minor impacts during site preparation/excavation. Long-Term: Nominal impact from loss of vegetation on construction site; vegetation is common throughout base and site would be re-landscaped.
Wildlife	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Threatened and Endangered Species	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Water Resources		
Groundwater	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Surface Water	Short-Term: No impact.	Short-Term: Potential minor impacts during site preparation, excavation, and construction activities. Impacts would be minimized because erosion and siltation controls would be implemented.
Floodplains	Long-Term: No impact. Short-Term: No impact. Long-Term: No impact.	Long-Term: No impact. Short-Term: No impact. Long-Term: No impact.
Wetlands	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
IRP Sites	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Land Use	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: The land use where the west and south parking lot would be located would change to Housing Unaccompanied from Community Commercial and Open Space, respectively.

Table 2.5-1
Comparison of Environmental Consequences
of the Proposed Action and Alternative
Page 2 of 2

Resources	Alternative A: No Action	Alternative B: Construction of an Airman Dormitory (Proposed Action)
Geology and Soil	Short-Term: No impact. Long-Term: No impact.	Short-Term: Potential minor impacts during site preparation, excavation, and construction activities (i.e., soil erosion). Impacts would be minimized because erosion and siltation controls would be implemented. Long-Term: No impact.
Cultural/Historic Resources	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Air Quality	Short-Term: No impact. Long-Term: No impact.	Short-Term: Minor, short-term impact from particulate matter and engine exhaust emissions generated during demolition, excavation, and construction. Long-Term: No impact.
Noise	Short-Term: No impact. Long-Term: No impact.	Short-Term: Minor impacts on ambient noise from site preparation, excavation, and construction activities. Long-Term: No impact.
Health and Safety	Short-Term: No impact. Long-Term: No impact.	Short-Term: Potential impacts to project workers due to accidents during demolition, excavation, and construction activities. Impacts would be minimized because workers would be responsible for adhering to applicable health and safety regulations. Long-Term: No impact.
Socioeconomics	Short-Term: No impact. Long-Term: No impact.	Short-Term: Nominal beneficial impact on local economy from revenue generated by action. Long-Term: No impact.
Transportation/Traffic	Short-Term: No impact. Long-Term: No impact.	Short-Term: Nominal, intermittent impacts from construction traffic. Long-Term: Nominal increase in traffic as a result of occupancy of new dormitory.

3.0 Affected Environment

3.1 Introduction

This chapter describes the environment of the area that will be potentially affected by the proposed action and alternative. This chapter also provides the background information and a basis for the analysis of environmental impact in Chapter 4.0.

3.2 Natural Resources

3.2.1 Vegetation

The proposed location for the construction of the airman dormitory and associated parking lots is in an area designated by the base as “improved grounds,” which include areas such as lawns and landscaped areas. The proposed location for the dormitory is an existing parking lot and vegetation is limited to the outside areas. Vegetation in these areas consists primarily of grasses (Figure 2.4-1). The proposed locations of the west and south parking lots are open spaces covered by primarily covered by grasses and weeds (Figure 2.4-1 and 2.4-2). Dominant species include tall fescue (*Festuca arundinacea*), Kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*), and clover (*Trifolium pratense* and *T. repens*). Improved grounds are routinely maintained so that grass heights are between 2.5 and 4 inches (WPAFB, 2001a).

Trees and shrubs planted on improved grounds often include white and green ash (*Fraxinus americana* and *F. pennsylvanica*), sweetgum (*Liquidambar styraciflua*), burning bush (*Euonymus alatus compacta*), and viburnum (*Viburnum sp.*) (WPAFB, 2001a).

3.2.2 Wildlife

According to the Site-wide Characterization Report (ICI/SAIC, 1995), resident mammals commonly found in commercial/industrial areas and other disturbance areas, such as the proposed location of the airman dormitory, include eastern cottontail rabbit (*Sylvilagus floridanus*), chipmunk (*Tamias striatus*), opossum (*Didelphis virginiana*), and gray squirrel (*Sciurus carolinensis*). Birds, such as pigeon (*Columba leucocephala*), killdeer (*Charadrius vociferous*), English sparrow (*Passer domesticus*), mockingbird (*Mimus polyglottos*), and red-winged blackbird (*Agelaius phoeniceus*) are also often observed in these area types.

3.2.3 Threatened and Endangered Species

Compliance with Air Force Policy Directive (AFPD) 32-70 and AFI 32-7064 requires all Air Force properties to protect species classified as endangered or threatened under the Endangered Species Act of 1973 (ESA) and to comply with State of Ohio Law 1531.25 and its implementing regulations for species listed by the state as threatened and endangered. To comply with these requirements, WPAFB developed an Endangered Species Management Plan (BHE, 2001).

Federal- and state-listed species at WPAFB include the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), eastern massasauga rattlesnake (*Sistrurus c. catenatus*), clubshell (*Pleurobema clava*, a mussel), and blazing star stem borer (*Papaipema beeriana*, a moth).

The eastern massasauga rattlesnake is a federal candidate species usually found in wet areas including wet prairies, marshes, and low lying areas. Neither the historic nor current population size and status of massasaugas at WPAFB have been determined. Reports of massasauga sightings have been limited to the Prime Beef Training Area and Twin Base Golf Course. Because the massasauga rattlesnake is a Federal candidate species, there is no requirement to survey construction areas for potential snake habitat. No sightings of the massasauga rattlesnake have been reported within either area of the proposed action.

The Indiana bat habitat follows the lower reaches of Hebble Creek, Trout Creek, and the riparian corridor of Mad River from its northern reach in Area A to its confluence with Hebble Creek (ICI/SAIC, 1995; WPAFB, 2001a) where this species roosts during the summer and forages in the floodplain/riparian forests. In July 2000, two Indiana bats (a juvenile female and an adult post-lactating female) were captured along Trout Creek during a base-wide mist net survey (WPAFB, 2001a). Radio tracking of these two bats confirmed the presence of a maternity colony in a dead slippery elm (*Ulmus rubra*) in a woodlot on the campus of Wright State University. No sightings of Indiana bats have been reported within either area of the proposed action. The bats captured in 2000 were located in an area approximately 2.5 miles from the proposed construction site.

Copies of correspondence with the Ohio Department of Natural Resources (ODNR) and the U.S. Fish & Wildlife Service (USFWS) are provided in Appendices A and B, respectively.

3.3 Water Resources

3.3.1 Groundwater

The water table aquifer in Area A is part of the Buried Valley Aquifer system, a designated sole source aquifer (Figure 3.3-1). The unconsolidated water table aquifer material underlying the dormitory site is predominantly comprised of alluvial deposits including sands and gravels with lenticular beds of gravels, and silts and clays. The water table aquifer in Area C, located hydraulically downgradient of Area A, yields water prolifically and has been used as a drinking water supply (Figure 3.3-1). Groundwater in the planned dormitory site area is recharged through infiltration of precipitation, groundwater flow into the area, and infiltration of surface water. Groundwater occurs at approximately 32 feet below ground surface and flows west toward the Mad River. A regional groundwater divide exists along the Silurian period bedrock ridge that is connected by Huffman Dam (Figure 3.3-2).

3.3.2 Surface Water

Figure 3.3-2 depicts the regional surface water features in the vicinity of WPAFB. The only surface water feature in the vicinity of the site is an unnamed drainage ditch located 1,200 feet due south of the dormitory location (Figure 3.3-3). Surface water flow in the drainage ditch is from east to west. This unlined ditch receives surface water runoff from the parking lots, buildings, and lawns in the Kittyhawk Center as well as the remaining portion of Outfall Area 12 (Figure 3.3-4) before discharging through Outfall No. 12 into the concrete-lined drainage channel that forms Hebble Creek (Figure 3.3-5). Hebble Creek is located along Skeel Avenue in Area A and ultimately discharges into the Mad River near the southwestern corner of the Area C Base boundary. Hebble Creek also receives storm water runoff from surrounding Outfall Areas 11 and 13.

WPAFB storm water drainage to the Mad River is monitored under provisions of the National Pollutant Discharge Elimination System (NPDES). A NPDES permit places limits on the levels of certain pollutants that may be discharged into water bodies. Pollutants regulated at individual outfalls include total suspended solids (TSS), metals, oil and grease, chemical oxygen demand (COD), biological oxygen demand (BOD), benzene, toluene, ethylbenzene and xylenes (BTEX), total Kjeldahl nitrogen (TKN), total phosphorus, pH and temperature. Hebble Creek discharges into the Mad River through NPDES Outfall 004. Current results from the NPDES sampling at Outfall 004 indicate that all parameters are in compliance.

Storm water runoff from construction activities can impact water quality by contributing sediment and other pollutants exposed at construction sites. The NPDES Storm Water Program requires operators of both large and small construction sites to obtain authorization to discharge storm water under a National Pollutant Discharge Elimination System (NPDES) construction storm water permit. In 1990, the Phase I Storm Water regulations addressed construction activities that disturbed five or more acres of land [40 CFR 122.26(b)(14)(x)]. The NPDES Storm Water Program also addresses small construction activities, i.e., those that disturb between one and five acres of land, as a result of the Phase II rule. The Phase II rule becomes effective on 10 March 2003.

3.3.3 Floodplain

WPAFB is located within the Mad River valley of the Great Miami River Basin. The Mad River empties into the Great Miami River near the downtown of the City of Dayton. The planned dormitory location is approximately 2.0 miles southeast of the Mad River and is on flat ground at an elevation of approximately 835 feet above MSL. This area is above the Mad River 100-year floodplain elevation of 814.3 feet, MSL (ICI/SAIC, 1995).

3.3.4 Wetlands

A wetland delineation was conducted on WPAFB in 1999 (WPAFB, 2001a) using the Routine Onsite Determination Method (USACOE, 1987). A total of approximately 23 acres of wetlands were delineated in Areas B and C. No wetlands have been identified in Area A. Area B contains 1 acre of forested wetlands, 0.94 acres of scrub/shrub wetland, and 0.9 acres of emergent wetland. Area C contains 11.65 acres of forested wetlands, 0.68 acres of scrub/shrub wetlands, 5.29 acres of emergent wetlands, and 2.28 acres of open water wetlands.

Based on the wetland delineation conducted in 1999, no wetlands are located in the vicinity of proposed site for the airman dormitory. The nearest wetlands are over 2 miles west of the proposed construction site near Mad River.

3.4 Installation Restoration Program (IRP)

The Department of Defense (DoD) developed the IRP to identify, assess, and control potential environmental contamination that may have resulted from past operations and waste disposal practices. The IRP, an element of the Defense Environmental Restoration Program, is a part of the environmental program at each DoD installation. At WPAFB, the IRP is administered by the

88th Air Base Wing, Air Force Materiel Command (AFMC), through the Office of Environmental Management, Operations Branch. The base IRP is regulated under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and by two Federal Facility Agreements with the U.S. Environmental Protection Agency (USEPA) Region V and Ohio Environmental Protection Agency (OEPA). WPAFB currently has identified 68 IRP sites per the Air Force Restoration Information Management System (AFRIMS). WPAFB has grouped all confirmed or suspected sites requiring investigation and characterization in 11 geographically-based Operable Units (OUs), designated OUs 1 through 11 (IT, 1999). In addition to the 11 OUs, WPAFB addressed basewide issues of groundwater and surface water contamination under the Basewide Monitoring Program (BMP) (IT, 1995). The proposed location for the construction of the airman dormitory is not located within or near any OU or IRP site.

3.5 Land Use

WPAFB is divided into three areas: A, B, and C. Area A contains primarily administrative activities; Area B focuses on research and development; and Area C is dominated by airfield operation, maintenance, and civil engineering activities. The base encompasses 8,145 acres and is classified as non-industrial with mixed development. Ten major land use categories have been identified on WPAFB (WPAFB, 2001).

The proposed location of the airman dormitory is situated in an area currently classified as Housing Unaccompanied. The area for the proposed west parking lot is classified as Community Commercial, while the area for the proposed south parking lot is classified as Open Space. Land use surrounding this area is classified as Outdoor Recreation, Commercial, and Community Service (Woolpert, 2001).

3.6 Soils

According to the U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) soil survey of Greene County, Ohio (USDA-SCS, 1978) the soils at the planned dormitory location are of the Miamian-Urban land complex (MrB) and, are comprised of gently sloping glacial till soils. Most areas are used for urban or industrial development. About 25 to 50 percent is borrow and fill areas; and 20 to 60 percent is undisturbed areas of Miamian soils in undeveloped lots and parts of developed areas. Miamian soils consist of nearly level to steeply sloped soils that formed in glacial till. The surface soils consists of brown silty loam from 0 to 7 inches deep,

yellowish brown clay and clay loam from 7 to 24 inches deep, and brown loam from 24 to 32 inches deep. The substratum is yellowish brown loam and is encountered at depths of 32 to 60 inches. These soils exhibit moderately low permeability and are well drained. Runoff potential is generally minimal for the flat land surface at the proposed site.

In the deeper subsurface, the Kittyhawk area is part of the Buried Valley aquifer system and overlies a buried Pleistocene valley. Pre-glacial Teays Stage and interglacial Deep Stage drainage systems eroded this valley down to Paleozoic Era shale (Ordovician) and limestone (Silurian) (Figure 3.3-6). The valleys formed during the development of these drainage systems have been filled and obscured by outwash and till deposits formed during Wisconsin glacial stages and by alluvium deposited by modern streams in the area. The glacial and alluvial deposits form the Buried Valley Aquifer, a major source of water to the area.

3.7 Cultural Resources

Over 300 recorded or potential cultural resources have been identified within WPAFB, including prehistoric and historic archaeological sites, historic structures, and historic landscapes (WPAFB, 1999a). The base contains a number of significant cultural resources among those recorded.

The first large-scale prehistoric site survey at the base occurred in 1990 by the US Army Construction Engineering Research Laboratory (USACERL). Additional surveys by USACERL were conducted in 1991, 1992 and 1994. From November 1994 through April 1995, archaeological surveys were conducted at WPAFB by Great Lakes Archaeological Research Center, Incorporated (GLARC). In addition, a survey was conducted in 1995 and 1996 by Earth Tech/NES, Inc. (NES, 1996). Results from these surveys, plus additional surveys conducted at the base, have been summarized and presented in the Cultural Resources Management Plan (CRMP) (WPAFB, 1999a). The CRMP identifies archaeological sites, historic structures, and other significant cultural resources on WPAFB. A subsequent archaeological survey of selected areas on the base was conducted in 2001.

Based on information provided in the CRMP, it does not appear that any surveys have been conducted at the proposed location for the airman dormitory on Birch Street. The proposed construction site for the dormitory is located in a portion of the base that has disturbed soils; therefore, cultural resources are not expected to be within this area. According to the CRMP, the

current archaeological potential for this area is low. The CRMP does identify one known “potentially ineligible site” several blocks from the proposed construction area. (A potentially ineligible site is one that has been identified as being destroyed or disturbed.) This site, R8 T3 S26 #13, is classified as “Residential” and is located south of the proposed construction area.

3.8 Air Quality

The Clean Air Act Amendments of 1990 (CAAA) tasked the USEPA with generating a set of rules governing the establishment of air quality standards and rules governing emissions of pollutants. The CAAA of 1990 establishes a diverse program of air quality improvement activities involving research, air pollution controls on motor vehicles, controls of emissions of toxic materials, and issuing federal permits for air pollution sources (WPAFB, 1994b). Included in this program of air quality improvement activities is a mandate in Title I to USEPA to establish National Ambient Air Quality Standards (NAAQS). Accordingly, USEPA has set NAAQS concentration limits for the following pollutants, often referred to as "criteria air pollutants": carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO₂), lead, ozone (O₃; note: emissions of volatile organic compounds or VOCs are regulated as precursors of ozone), and particulate matter equal to or less than 2.5 microns in diameter (PM_{2.5}). Air quality issues associated with the proposed action for this EA are primarily related to site preparation (i.e., demolition of the existing parking lot at the site of the new dormitory), and excavation for and construction of the dormitory, the parking lots, and re-routed road.

WPAFB is located in the Dayton/Springfield area. This area is currently in attainment of all pre-1997 NAAQS [40 CFR 81.336]. In the 5 May 1995 *Federal Register* notice [60 FR 22289], this area was re-designated as “attainment” for ozone. As part of re-designation, the Dayton/Springfield area is considered a maintenance area for at least 10 years after re-designation. Because the base is located in a maintenance area that has a vehicle emissions testing program, all base fleet vehicles and employees’ privately owned vehicles must undergo emissions testing, even if registered outside of an E-Check county. This requirement is mandated by Section 118c of the CAA (42 USC 7418). In 1997, USEPA issued a new 8-hr NAAQS for Ozone replacing the 1-hr standard. The U.S. Court of Appeals for the D.C. Circuit withheld the implementation of the standard. The U.S. Supreme Court reversed the U.S. Court of Appeals decision. USEPA is reviewing the results of the litigation to determine the approach and schedule for implementation. The Regional Air Pollution Control Agency (RAPCA) in Dayton, Ohio [Ohio EPA local air agency regulating operations at WPAFB] has data indicating that

Greene and Montgomery counties do not meet the new 8-hr ozone standard and an official re-designation as “non-attainment area” shall occur at a later date.

Regulations have been established in the Ohio Administrative Code (OAC) to ensure attainment of the air quality standards is maintained. Air quality standards that apply to the proposed action and its alternative include the Particulate Matter Standards (OAC 3745-17) and Emergency Episode Standards (OAC 3745-25). Because there are no new stationary sources of air pollution associated with demolition, excavation, and construction, a PTI would not be required for these activities.

WPAFB has prepared and submitted a base-wide federal operating permit application for air emissions as specified under Title V of the Clean Air Act Amendments of 1990. This activity included an emissions inventory of approximately 1,450 stationary sources of criteria air pollutants. WPAFB has approximately 139 air emission sources that required permits to install (PTI). The remaining sources were exempt from a PTI by various provisions of OAC 3745-31-03 and OAC 3745-15-05. Of these permitted sources, only 29 are classified as “non-insignificant” air pollution sources in WPAFB's Title V permit application. Nine of these non-insignificant sources are coal and natural gas-fired boilers at the two central heating plants. These nine boilers generate by far the largest quantity of emissions from stationary sources at the base.

3.9 Noise

Noise can be defined as sound that is undesirable because it disrupts speech communication and hearing, is intense enough to damage hearing, or is otherwise irritating. Noise levels associated with WPAFB operations can create conflicts related to activities both on and off the base. Flight activities on WPAFB that contribute to the noise environment include the 445th Airlift Wing, the 47th Airlift Flight, and the Aero Club. The base also receives transient aircraft that represent the largest user group at 45 to 50 percent of the aircraft arriving and departing. The second largest user is the Aero Club.

When measuring sound to determine its effect on human population, A-weighted sound levels in decibels (dBA) are typically used to account for the response of the human ear. A-weighted sound levels represent adjusted sound levels according to a prescribed frequency response established by the American National Standards Institute (ANSI, 1983). An unusual property of

noise is that the sound pressure levels of two separate sounds are not directly additive. For example, two sounds of 70 decibels (dB) each occurring in the same location results in a cumulative noise level of 73 dB, not a doubling to 140 dB. In addition, if two sounds are of different levels, the lower level adds less to the cumulative total as the difference increases. For example, if a 60 dB noise source is used in conjunction with a 70 dB noise source, then a cumulative noise level of 70.5 dB would result. When two noise sources have greater than 10 dB difference, the lower noise source adds almost nothing to the higher noise level.

Noise levels can be considered in terms of levels ranging from those in a typical home at 40 dB, and levels at which noise begins to harm hearing if exposed for a long period (8 hours) at 90 dB. The following conclusions were obtained using 65 to 70 dB as a general background noise level and following USEPA prepared responses to sound-level increases (Chemical Nuclear Systems, 1990):

<u>Sound-Level Increase</u>	<u>Expected Community Response</u>
0 to 5 dB	No observed reaction
5 to 10 dB	Sporadic complaints
10 to 15 dB	Widespread complaints
15 to 25 dB	Threats of community action
More than 25 dB	Vigorous community action

Typical noise sources in and around the proposed dormitory include aircraft and human activities.

The L_{dn} is an accepted unit for quantifying human annoyance to general noise that has been officially adopted for aircraft noise impact characterization and land use compatibility planning in the United States. This unit is the time-integrated average A-weighted sound level during a 24-hour period. Specific L_{dn} land use compatibility criteria have been adopted by the Federal Intragency Committee on Noise (FICON, 1992) or the Federal Aviation Administration (FAA) recommended L_{dn} ranges for various land use categories based upon the committee's guidelines. In airport analyses, areas with L_{dn} above 65 dB are often considered in land use compatibility planning and environmental assessments; therefore, the contours of L_{dn} greater than 65 dB are of particular interest.

To address both noise and safety, the DoD required military departments to establish an Air Installation Compatible Use Zone (AICUZ) program. The goal of AICUZ is to promote

compatible land use on and off base to minimize noise complaints and safety hazards. According to the AICUZ study, the proposed dormitory is located in the <65 dB noise zone (WPAFB, 1995). These noise ranges represent existing conditions to which potential noise levels from demolition, excavation, and construction can be compared.

3.10 Health and Safety

General health and safety issues associated with the proposed dormitory include worker safety and public safety during the construction as well as subsequent operation of the facility. Occupational and public safety issues are addressed with respect to site preparation, excavation, and construction activities.

Health and safety issues for the dormitory include hazards associated with the demolition of the existing parking lot and road, construction of the dormitory and new parking areas, and the re-routing of the road. Such hazards include physical hazards, potential chemical hazards (e.g., fuel, building materials), and underground/overhead utility hazards. The demolition crew would be responsible for adhering to applicable health and safety regulations (Table 1.4-1). Physical hazards would include typical construction slips/trips/falls, hazards due to heavy and light on-site equipment usage, and vehicle accidents.

There are no records indicating that hazardous materials or wastes had been disposed of in the proposed construction area. However, workers could potentially be exposed to chemicals associated with construction equipment (e.g., fuels, vehicle exhaust, welding fumes) or building materials (e.g., paints, insulation). As discussed in Section 3.8, particulate matter would be generated during site preparation (i.e., demolition of parking lot), excavation, and construction activities.

Due to the presence of other structures in the area, there are underground and overhead utility lines in the area. These structures include the adjacent dormitories, administrative buildings, the commissary, and private residences that are located on the other side of the base boundary (i.e., across the fence line). The private residences are approximately 1,000 ft from the proposed construction site.

The Air Force AICUZ program is intended to reduce the potential for aircraft mishaps in populated areas. As a result of this program, WPAFB has altered basic flight patterns to avoid

heavily populated areas. In additions, airfield safety zones were established under AICUZ to minimize the number of people who would be injured or killed if an aircraft crashed. Three safety zones are designated at the end of all active runways: Clear Zone, APZ I, and APZ II. The Clear Zone represents the most hazardous area. Although administrative uses (industrial, business services, manufacturing) are permitted in the APZs, “people-intensive” uses (e.g., auditoriums and classrooms) are discouraged in these areas. According to AFI 32-7063, all new construction is required to comply with the AICUZ. The proposed site for the dormitory is located outside of all APZs.

3.11 Socioeconomics

Total population in the Dayton-Springfield Metropolitan Statistical Area (MSA) in 1999 was estimated as 958,698 (U.S. Census Bureau, 2002). Between 1990 and 1999, total population in the MSA increased 0.8 percent. Further description of the population is available from the U.S. Census Bureau (2002).

Employment in the four-county area is concentrated in the services, manufacturing, retail, and government sectors. Income by industry for persons employed in the MSA during 1992 was greatest in manufacturing (29.6 percent), services (24.9 percent), government (18.5 percent), and health services (10.8 percent) (ICI/SAIC, 1995). WPAFB, with 18,373 employees in 2001, provides a major source of employment in the four-county area (WPAFB, 2001b).

It is estimated that 19,777 secondary jobs have been created in private industry in the four-county region surrounding WPAFB. WPAFB awards numerous contracts every year to local businesses. In FY00, for example, contract activity in the economic impact region exceeded \$656 million (WPAFB, 2001b).

3.12 Transportation/Traffic

Several major highways are located near WPAFB, including Interstate 675, a major bypass highway situated to the east and south of the base. Interstate 70, a major east/west highway is located north of the base; Interstate 75, a major north/south highway is located west and south of the Base; State Route 444 bisects the base.

The proposed construction site for the dormitory would be accessed via entry through Gate 38C on State Route 444 to Oak Street to Birch Street. The estimated average daily traffic count for Gate 38C (inbound/outbound) is 5,234 (WPAFB, 2002b). Gate 39C also provides access to the

Kittyhawk area. The estimated average daily traffic count for Gate C (inbound/outbound) is 3,457.

Recent traffic counts were obtained for Birch Street (between Buckeye and Hemlock Streets) from 24 June 2002 through 2 July 2002 (WPAFB, 2002b). The estimated average daily counts for westbound and eastbound Birch Street are 452 and 472, respectively.

4.0 Environmental Consequences

4.1 Introduction

The purpose of this chapter is to provide an evaluation of the potential impacts associated with the proposed action (construction of an airman dormitory) as well as the No Action alternative presented in Chapter 2.0. The No Action alternative represents the baseline conditions to which the proposed action is compared. The evaluation of the proposed action and alternative is summarized in Table 2.5-1.

4.2 Natural Resources

4.2.1 Vegetation

4.2.1.1 Alternative A: No Action

Vegetation would not be impacted under the No Action alternative.

4.2.1.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Under Alternative B, minor negative impacts would occur to vegetation surrounding the construction site during site preparation/excavation. The construction site would be graded, which would result in the removal of turf and other cover material. Vegetation at the site impacted would include grasses, weeds and a limited number of trees; species impacted are those commonly found throughout the base. After construction of the dormitory is complete, the area would be landscaped with grasses, ornamental shrubs, and trees.

4.2.2 Wildlife

4.2.2.1 Alternative A: No Action

There would be no impacts under the No Action alternative.

4.2.2.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Impacts to wildlife would not be expected during the construction of the dormitory, nor would any long-term impacts be expected.

4.2.3 Threatened and Endangered Species

4.2.3.1 Alternative A: No Action

Threatened and endangered species would not be impacted under the No Action alternative.

4.2.3.2 *Alternative B: Construction of an Airman Dormitory (Proposed Action)*

No threatened or endangered species are located in the vicinity of the proposed construction site. Therefore, no impacts would be expected.

4.3 *Water Resources*

4.3.1 *Groundwater*

4.3.1.1 *Alternative A: No Action*

Under the No Action Alternative, groundwater resources are not expected to be impacted.

4.3.1.2 *Alternative B: Construction of an Airman Dormitory (Proposed Action)*

The new dormitory will have concrete slab floors and minimal subsurface intrusion due to utility lines. The water table in this area ranges between approximately 31 and 33 feet bgs (Section 3.3) and will not intersect any shallow subsurface utility lines. The building structure, parking lots, and new road extension would impede recharge of the water table aquifer at those areas that are currently covered by the lawn in the immediate vicinity of the dormitory location. The slight reduction in recharge would not affect the Buried Valley Aquifer.

No other potential groundwater impacts have been determined. Therefore, construction of the dormitory at the planned location (Figure 1.1-3) is not expected to impact groundwater resources.

4.3.2 *Surface Water*

4.3.2.1 *Alternative A: No Action*

Surface water resources would not be impacted under the No Action Alternative.

4.3.2.2 *Alternative B: Construction of an Airman Dormitory (Proposed Action)*

The new dormitory will be a three-story building with a roof area that is approximately the same size as the existing dormitories adjacent to the site. Currently, the new dormitory location is a parking lot; therefore, the new dormitory will not generate additional surface water runoff. The new parking lots shown in Figure 1.1-3 will have surface areas of approximately 62,500 ft² (west lot) and 50,000 ft² (south lot). Total surface area from the two lots will equal approximately 2.58 acres. The volume of surface water generated from the two lots during a one-hour storm event where one inch of water falls would equal approximately 70,000 gallons of water. Allowing for

depression storage in the parking lots and infiltration in the unnamed drainage ditch that would receive the runoff, the additional surface water flow in the ditch would be approximately 1,000 gallons per minute. The approximately 20-foot wide storm drainage ditch that currently services this portion of the Kittyhawk area (Figure 3.3-4) would handle this additional flow. Surface water from this storm drain network will combine with surface water from other downgradient areas and ultimately discharge through WPAFB Drainage Outfall No. 12 into Hebble Creek (Figure 3.3-4). Drainage Outfall No. 12 is monitored as NPDES Outfall 004.

As discussed in Sections 1.4 and 3.3.2, a permit for discharge associated with disturbance of five or more acres of land would be required under Phase I of the storm water regulations. A permit for discharge associated with disturbance of one to five acres of land would be required under Phase II. The Phase II rule becomes effective on 10 March 2003 (WPAFB, 2002c). Although the total area to be disturbed during the proposed project has not been finalized, the construction site would be greater than one acre. Therefore, a NPDES construction permit from the Ohio EPA would be required for Drainage Outfall No. 12. Provisions for erosion control and adherence to construction specifications would minimize impacts due to runoff generated during construction activities.

4.3.3 Floodplain

4.3.3.1 Alternative A: No Action

Floodplain management would not be impacted under the No Action Alternative.

4.3.3.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Construction of the planned airman dormitory at the proposed site would generate additional storm water runoff from the new parking lots in comparison to the vegetated land surface currently existing. However, the impact of the additional volume of water generated by the new building and parking lot in relation to the capacity of the drainage system would be minimal. The new parking lots would not take away or add to the existing flood storage capacity.

The elevation of the proposed construction site within Area A (835 feet, MSL) is above the Mad River 100-year flood plain elevation (814.3 feet, MSL) and floodplain management capacity would not be impacted under Alternative B.

4.3.4 Wetlands

4.3.4.1 Alternative A: No Action

Wetlands would not be impacted under the No Action alternative.

4.3.4.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

There are no wetlands in the vicinity of the proposed construction site. Therefore, wetlands would not be impacted.

4.4 Installation Restoration Program Sites

4.4.1 Alternative A: No Action

The No Action alternative would have no impact on any IRP sites.

4.4.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

The proposed construction site is not located within or near an IRP site. Therefore, no impacts to any IRP sites would occur.

4.5 Land Use

4.5.1 Alternative A: No Action

Land use would not change under Alternative A. Therefore, Alternative A would have no impact on land use.

4.5.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Land use of the proposed location of the airman dormitory would remain Housing Unaccompanied. Land use where the west parking lot would be located would change from Community Commercial to Housing Unaccompanied. Land use where the south parking lot would be located would change from Open Space to Housing Unaccompanied.

4.6 Soils

4.6.1 Alternative A: No Action

Soils would not be impacted under the No Action Alternative.

4.6.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

The land at the proposed location for the new airman dormitory is currently being used as a parking lot and the area for the new parking lots is primarily lawn. Some excavation will be required for installing utility lines and leveling the land surface for the parking lots. With the

land surface being relatively level, the erosion potential for these initial activities will be minimal. Erosion control measures would be implemented during all construction activities until a vegetative cover is established. The use of heavy equipment would result in soil compaction in and around the construction area. Potential impacts from the compacted soils include reduced erosion and increased runoff in areas where vegetation has been removed. The completed dormitory and parking lot would not continue to impact to area soils.

4.7 Cultural Resources

4.7.1 Alternative A: No Action

No impacts to cultural resources would occur under the No Action alternative.

4.7.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Because the proposed construction site is located in an area that has been disturbed, no impacts to cultural resources are expected to occur under the proposed action. No known archaeological, historic, or Native American ceremonial/traditional sites are expected within the site boundaries. In the event that cultural items are encountered during project activities, work would cease immediately and the Base Historic Preservation Officer (BHPO) would be contacted to assess the items.

4.8 Air Quality

4.8.1 Alternative A: No Action

No impacts to air quality would occur under the No Action alternative. There would be no impact on the ability of the Dayton-Springfield area to retain its "Attainment" status. A conformity determination, in accordance with 40 CFR 93.153(c)(1), is not required because the total of direct and indirect emissions from Alternative A would likely be below the *de minimis* thresholds specified at 40 CFR 93.153(b)(1).

4.8.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

In the short-term, there would be minor, negative impacts to air quality. Impacts from site preparation, excavation, and construction of the dormitory include the generation of fugitive dust and particulates from the demolition of the current parking lot and the removal and grading of soil for the foundation and parking lot. In addition, there would be minor, short-term emissions from vehicles that would travel in the construction area.

During construction, dust suppression measures would be used to minimize fugitive dust emissions. To establish a basis for comparison of air quality impacts from the project alternatives with respect to normal base operations, previous estimates of normal baseline particulate emissions were considered to be air emissions reported in WPAFB's annual emission fee report submitted to OEPA for 2001. Emission factors for fugitive emissions associated with heavy construction operations were obtained from Section 13.2.3 of AP-42, *Compilation of Air Pollutant Emission Factors, Volume I: Stationary Sources, Fifth Edition* (USEPA, 1995), based on 80 percent control efficiency for wet suppression (using engineering estimates).

For site preparation, excavation, and construction activities at the dormitory site, particulate matter (PM₁₀) emissions of 7.2 tons per year (tpy) were estimated based on assumptions that a total of 5 acres would be disturbed and the duration of the construction activities would be 6 months. This amount is approximately 34.4 percent of the estimated normal baseline (20.9 tpy) at WPAFB. Supporting data for these estimates are shown in Appendix C.

Alternative B would have a negligible impact on the ability of the Dayton-Springfield area to retain its "Attainment" status. A conformity determination, in accordance with 40 CFR 93.153(c)(1), is not required because the total of direct and indirect emissions from Alternative B would be below the thresholds specified for maintenance areas at 40 CFR 93.153(b)(1). The threshold specified for particulate matter (PM₁₀) is 100 tpy. The estimated PM₁₀ from construction activities (7.2 tpy) are below the threshold.

There would be no long-term impacts due to fugitive dust because a majority of the area will be covered by the dormitory or the parking lots. The remaining areas would be vegetated.

4.9 Noise

4.9.1 Alternative A: No Action

The No Action alternative would not result in impacts to noise because there would be no demolition, excavation, or construction activities.

4.9.2 Alternative B: Construction of an Airman Dormitory

For persons at a distance of approximately 50 feet, minor (i.e., 0-10 dB increase over background noise) to moderate (i.e., 10-15 dB increase) impacts on ambient noise could result from construction activities involving heavy equipment such as trucks and bulldozers. Noise levels

associated with common construction equipment are: bulldozers (79-91 dB at 50 ft), backhoes (73-94 dB at 50 ft), trucks (83-93 dB at 50 ft), front-end loader (75-79 dB at 50 ft), roller or compactors (72-75 dB at 50 ft) (WPAFB, 1994c). In the event that jackhammers are used in the demolition of the parking lot, this equipment would contribute 66–86 dB at 50 ft (Engels, 2002).

Construction crews could experience short-term adverse impacts. Noise levels would be more intense in the construction area. Impacts would be minimized because workers would be responsible for adhering to health and safety regulations.

There would be minor, negative impacts to occupants of buildings near the proposed dormitory. These buildings would include the adjacent dormitories, administrative buildings, and the commissary. In addition, the closest private residences located on the other side of the base boundary (i.e., the fence line) approximately 1,000 ft from the proposed construction site. Increases in noise levels are expected to be intermittent while the proposed action is carried out. Because building materials can reduce sound, those individuals inside the buildings would experience less noise than those working outdoors. Impacts would be minimized by conducting demolition, excavation, and construction activities to typical working hours (e.g., 7:30 AM to 4:30 PM).

4.10 Health and Safety

4.10.1 Alternative A: No Action

The No Action alternative would not impact health and safety because there would be no demolition, excavation, or construction activities.

4.10.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Because construction workers at the proposed dormitory would be responsible for complying with standard operating procedures and applicable health and safety regulations (Table 1.4-1), no impacts to worker health and safety would be expected. The location of buried utilities would be identified prior to demolition or excavation activities. “Digging clearances” would be obtained from the Department of Civil Engineering and Base Utilities prior to excavating soil and installing utility lines. To minimize vehicle accidents, construction personnel would direct heavy vehicles entering and exiting the site.

As discussed in Section 4.8, the area under demolition, excavation, or construction would be sprayed with water to minimize the generation of airborne particulate matter and its dispersion to adjacent areas to the construction site as well as to the residential area located across the base boundary.

4.11 Socioeconomics

4.11.1 Alternative A: No Action

The No Action alternative would have no effect on socioeconomics.

4.11.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

Nominal, temporary socioeconomic impacts could occur during construction activities.

Although there would be no significant impact on the overall economic activities surrounding the base, there would be a short-term beneficial impact on the local economy. Contractors and local businesses would benefit from employment and income through contracts associated with the proposed task. No long-term impacts are anticipated.

4.12 Transportation/Traffic

4.12.1 Alternative A: No Action

The No Action alternative would have no effect on transportation/traffic.

4.12.2 Alternative B: Construction of an Airman Dormitory (Proposed Action)

There would be a short-term impact to traffic circulation due to project vehicles using primary and secondary arterial roadways in and around Birch Street. A nominal increase to traffic circulation along Birch Street and Oak Street could be expected once the dormitory is operational. The proposed dormitory would include 144 rooms. Therefore, an additional 144 vehicles could be anticipated during periods of full occupancy.

4.13 Cumulative Impacts

Cumulative effects are those that may result from the incremental impact of the federal action (removal of vegetative aircraft obstructions) when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions (See 40 CFR § 1508.7).

No actions would be taking place in the vicinity of the airman dormitory during its construction. Therefore, no cumulative effects on resources evaluated in the preceding sections would be anticipated.

4.14 Unavoidable Adverse Effects

If the proposed action were implemented, there would be a commitment of soil that is excavated as part of the site preparation/construction work and a commitment of soil and vegetation that is excavated if soil remediation is necessary. Impacts to vegetation would be minor because the species types are common to the base (i.e., ordinary vegetation) and the areas excavated would be re-seeded/landscaped. Minor impacts from noise would slightly affect passers-by and nearby workers. The increase in noise would be primarily due to construction/excavation equipment. The noise would only exist during working hours and would end at the completion of the operation. Negligible increases in traffic would occur during the proposed action and once the dormitory becomes operational.

4.15 Relationship of Short-Term Uses and Long-Term Productivity

By constructing a new dormitory, adequate housing would be provided for unaccompanied enlisted personnel.

4.16 Irreversible and Irretrievable Commitments of Resources

CEQ regulations in 40 CFR 1502.16 require that an agency identify any irreversible or irretrievable commitments of resources that would be involved in the proposed action, should it be implemented. Capital, energy, materials, and labor would be required for the action. These resources are not retrievable.

5.0 List of Preparers and Contributors

The following individuals assisted in the preparation of or provided background information for this EA.

<u>Name/Expertise</u>	<u>Role</u>	<u>Affiliation</u>
Ajay Bahri Air Quality	Air Quality	IT Corporation – Cincinnati, OH
Teresa Carleton NEPA Procedures, Biology	Primary Author	IT Corporation – Cincinnati, OH
Cynthia Hassan NEPA Procedures	Project Manager Health & Safety	IT Corporation – Cincinnati, OH
Gregory Plamondon Geology	Soils, Water	IT Corporation – Cincinnati, OH
William Scoville Engineering	Senior Review	IT Corporation – Cincinnati, OH
Lawrence Verdier Certified Industrial Hygienist	Noise	IT Corporation – Cincinnati, OH

6.0 List of Agencies and Persons Consulted

The following agencies and persons have been consulted during the preparation of this EA.

Rick Baumann	Traffic Engineer	88 ABW/CECP
Treva Bashore	Storm Water	88 ABE/EMO
Ken Lammers	Threatened and Endangered Species	U.S. Fish and Wildlife Service
Thomas Perdue	EIAP Program Manager	88 ABW/EMO
Butch Grieszmer	Natural Resources	Ohio Department of Natural Resources; Division of Natural Areas & Reserves; Columbus, OH

7.0 References

American National Standards Institute (ANSI), 1983, ANSI SI.4-1983, Specifications for Sound Level meters, New York.

BHE Environmental, Inc. (BHE), 2001, Endangered Species Management Plan for Wright-Patterson Air Force Base, Wright-Patterson Air Force Base, 88th Air Base Wing, Office of Environmental management, WPAFB, Ohio, October.

Callahan, E.V., R.D. Drobney, and R.L. Clawson, 1997, Selection of summer roosting sites by Indiana bats (*Myotis Sodalis*) in Missouri, *Journal of Mammalogy*, 78(3):818-825.

Chemical-Nuclear Systems, Inc., 1990, Environmental Assessment for Dismantlement and Disposal of the Air Force Nuclear Engineering Center, Wright-Patterson Air Force Base, Ohio, April.

Engels, 2001, Noise Levels of Equipment Used Outdoors,
<http://www.xs4all.nl/~rigolett/ENGELS/equipment/equipfr.htm>

Federal Intragency Committee on Noise (FICON), 1992, Federal Agency Review of Selected Analysis Issues, August.

Great Lakes Archaeological Research Center, Inc. (GLARC), 1996, Archaeology, Geomorphology and Land Use History at Wright-Patterson Air Force Base, Ohio, Reports of Investigations 389, September.

International Consultants Incorporated and Science Applications International Corporation (ICI/SAIC), 1995, Final Site-Wide Characterization Report, Wright-Patterson Air Force Base Environmental Management 88th Air Base Wing, 3 March.

IT Corporation (IT), 1995, Site-Specific Work Plan for Remedial Design Tasks for the Base-Wide Monitoring Program.

IT Corporation (IT), 1999, Final Engineering Evaluation/Cost Analysis, Groundwater Basewide Monitoring Program, Wright-Patterson Air Force Base, Evaluation of Remedies for Groundwater Operable Unit, Wright-Patterson Air Force Base, Ohio, 31 March.

NES, Inc., 1996, Phase I Archaeological Investigation of 35 Historical Period Sites, Wright-Patterson Air Force Base, Dayton, Ohio. Prepared with Earth Tech for U.S. Army Corps of Engineers, Fort Worth District, and Wright-Patterson Air Force Base.

Ohio Environmental Protection Agency, 2000, Emissions Inventory Data for Clark, Greene, Miami, and Montgomery Counties, www.epa.state.oh.us/dapc/aqmp/eiu/eiu.html.

U.S. Army Corps of Engineers (USACOE), 1987, Wetlands Delineation Manual, Department of Army, Waterways Experiment Stations, Corps of Engineers, Washington, D.C.

U.S. Department of Agriculture, Soil Conservation Service (USDA-SCS), 1978, Soil Survey of Greene County, Ohio, in cooperation with Ohio Department of Natural Resources and Ohio Agricultural Research and Development Center.

U.S. Census Bureau, 2002, On-line statistics, <http://eire.census.gov/popest/archives/metro/ma99-01.txt>.

U.S. Environmental Protection Agency (USEPA), 1995, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Sources, Fifth Edition.

Woolpert Consultants, 2001, 95 Percent Submittal, Wright-Patterson Air Force Base General Plan, Wright-Patterson Air Force Base, Ohio, May.

Wright-Patterson Air Force Base, 1994a, Acquisition Management Facility Improvement Plan (Revised and Abbreviated) Area B, Wright-Patterson Air Force Base, Ohio, March.

Wright-Patterson Air Force Base (WPAFB), 1994b, Environmental Assessment, Source Control Operable Unit Landfills 8 and 10, Wright-Patterson Air Force Base, Ohio.

Wright-Patterson Air Force Base (WPAFB), 1995, Air Installation Compatible Use Zone (AICUZ) Study, Wright-Patterson Air Force Base, Ohio.

Wright-Patterson Air Force Base (WPAFB), 1999, Final Cultural Resources Management Plan, November.

Wright-Patterson Air Force Base (WPAFB), 2001a, Final Integrated Natural Resources Management Plan, Wright-Patterson Air Force Base, Ohio, October.

Wright-Patterson Air Force Base (WPAFB), 2001b, Economic Impact Analysis, Wright-Patterson Air Force Base, Ohio, September.

Wright-Patterson Air Force Base (WPAFB), 2002a, FY 2003 Military Construction Plan Data (DD Form 3191), Dormitory, Project Number ZHTV973211, provided to IT Corporation at 25 June 2002 meeting.

Wright-Patterson Air Force Base (WPAFB), 2002b, Personal communication between Richard Baumann (WPAFB) and Cynthia Hassan (IT Corporation), 7 November.

Wright-Patterson Air Force Base (WPAFB), 2002c, Personal communication between Treva Bashore and Cynthia Hassan (IT Corporation), 7 November.